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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,900	10/14/2003	Norbert P. Kusters	14917.0231USU1/MS301905.0	3563

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EXAMINER	
ABEL JALIL, NEVEEN	
ART UNIT	**PAPER NUMBER**
2165	
MAIL DATE	**DELIVERY MODE**
02/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/684,900	KUSTERS ET AL.
	Examiner	**Art Unit**
	NEVEEN ABEL JALIL	2165

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *October 30, 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,4-10,12-14 and 16-22* is/are pending in the application.

4a) Of the above claim(s) *2, and 4-10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-14,16-18,21 and 22* is/are rejected.

7)☒ Claim(s) *19 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 30-October-2008 has been entered.

2. The amendment filed on 30-October-2008 has been received and entered. Claims 2, 4-10, 12-14 and 16-22 are pending of which claims 2, and 4-10 are withdrawn from consideration.

Claim Objections

3. Claim 12 is objected to because of the following informalities:

The steps of the method claim do not explicitly set forth the requiremnt of hardware to perform them to comply with CAFC decision **In re Bilski** that a patentable process under 35 U.S.C § 101 must either be (1) tied to a particular machine or (2) transform a particular article. In this case, at least one of the limitations of the claim must require the use of computer hardware. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 12-14, and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Bradford et al. (U.S. Patent No. 5,956,745).

As to claim 12, Bradford et al. discloses in a data storage system comprising a file system and one or more disk volumes, each volume comprising files and blocks, wherein each file is implemented by a set of one or more blocks, wherein blocks currently implementing a file are occupied-space blocks and all other blocks are free-space blocks, a method comprising:

taking a snapshot of an original volume (See column 2, lines 42-51, prior art, and see column 3, lines 1-20, wherein a copy, an image, a back-up, or a snapshot is well known to occur at the time of defragmentation or back-up) using a first program that is configured to mediate between the file system and a block driver (the claim is not specific to what this program is, therefore, its taken to be the software routines running the application);

wherein taking the snapshot includes creating a bitmap comprising a plurality of bit spaces, wherein each bit space corresponds to a respective block in the original volume, wherein each bit space is set either to an ignore value or to a protect value, and wherein initially a bit space is set to the ignore value when the respective block that corresponds to the bit space is a free-space block when the snapshot is taken, and a bit space in set to the protect value when the respective block that corresponds to the bit space is an occupied space block when the snapshot is taken (See Figure 6G, and see column 3, lines 51-56);

monitoring moves of occupied-space blocks in the original volume, wherein moving an occupied-space block comprises transferring contents from within the occupied-space block to a second block, which is one of the free-space blocks, the second block becoming an occupied-space block, and the first block becoming a free-space block (See column 3, lines 63-67);

monitoring writes of blocks in the original volume (See column 3, lines 63-67);

wherein monitoring the writes of the blocks includes determining which blocks to protect by copy-on-write operations before the writing of the blocks such that data in that block is preserved and which blocks not to protect by the copy-on-write operations (See column 21, lines 24-30, wherein the protect before write is taught); and

wherein monitoring the moves and the writes comprises using the first program to intercept efforts by the file system to access blocks in the original volume (See column 19, lines 1-19, wherein the disk analysis process includes intercepting access requesting using the FAT-bitmap and generating an error if they no longer exist on original volume)

producing a snapshot versions of blocks in response to a read requests (See column 4, lines 36-38, and see column 4, lines 58-58, wherein each update is a version) using the information on which blocks to protect by the copy-on-write operations and which blocks not to protect (inherent uses of file allocation bitmap tables in defragmentation operations, wherein Bradford marks the blocks as free or in-use to show write protection) .

As to claim 13, Bradford et al. discloses wherein monitoring the moves includes intercepting a block copy command passed down by the file system (See column 4, lines 57-58).

As to claim 14, Bradford et al. discloses wherein moves of blocks include moves that are associated with a defragmentation operation (See Figure 11B, workflow associated with defragmentation operation move).

As to claim 16, Bradford et al. discloses wherein monitoring the moves, monitoring the writes and producing the snapshot versions of blocks includes recording information regarding a current actual locations of the snapshot versions of the blocks in the original volume (See column 18, lines 21-32, wherein FAT and bitmaps are periodically updated as move operation occur and status notices are kept in a table).

As to claim 17, Bradford et al. discloses wherein monitoring a write of a block further comprises:

when the bit space in the bitmap corresponding to the block is set to the protect value, copying the block to a location in a differential storage space (See Figure 6G);

setting the bit space to the ignore value (See Figure 6G);

when the block to be written is recorded as the current actual location of the snapshot version that relates to a different block in the original volume, recording the location of the copy in the differential storage space as the current actual location for the snapshot version of that different block, and otherwise recording the location of the copy in the differential storage space as the current actual location for the snapshot version of the block to be written (See Figure 11A, shows workflow and recordation of current location in FAT after defragmentation); and

permitting the write to proceed; and

when the bit space in the bitmap corresponding to the block is set to the ignore value, permitting the write to proceed (See Figure 7, shows bitmap of moved block).

As to claim 18, Bradford et al. discloses further comprising, when the bit space in the bitmap corresponding to the block to be written is set to the protect value (See Figure 6A, FAT table functionality):

deleting each entry in a translation table that indicates that the block to be written is the current actual location for the snapshot version of a different block (See column 4, lines 49-61, wherein “deleting” is read on “update”), and

recording in a new table entry the location of the copy in the differential storage space as the current actual location for the snapshot version of the block to be written (See column 4, lines 49-61, wherein “ a new table entry” is read on “update”).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradford et al. (U.S. Patent No. 5,956,745) in view of Armangau et al. (U.S. Patent No. 6,934,822).

As to claim 21, Bradford et al. discloses the claimed invention but does not explicitly teach wherein producing the snapshot version of blocks in response to the read request comprises directing the read request to the current actual location of the snapshot version of the blocks.

Armangau et al. teaches wherein producing the snapshot version of blocks in response to the read request comprises directing the read request to the current actual location of the snapshot version of the blocks (See Armangau et al. Figure 37, shows different snapshot versions).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Bradford et al. by the teachings of Armangau et al. to include wherein producing the snapshot version of blocks in response to the read request comprises directing the read request to the current actual location of the snapshot version of the blocks because keeping versions of snapshots is necessary and efficient for data recover (See Armangau et al. column 1, lines 60-65).

As to claim 22, Bradford et al. as modified discloses wherein a translation table is used to record information regarding the current actual locations of the snapshot versions of the blocks (See Armangau et al. Figure 37, shows different snapshot versions), the method further comprising:

when the block to be read has a table entry indicating the current actual location of the snapshot version, redirecting the read to that location, and otherwise, directing the read to the version of the block in the original volume (See Armangau et al. Figure 37, shows different snapshot versions).

Allowable Subject Matter

8. Claims 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

9. Applicant's arguments filed on 10/30/08 have been fully considered but they are not persuasive.

Applicant's argument that "cited art fails to teach a first program that monitors block moves and writes by a second program in order to determine which blocks to protect within a snapshot" is noted but not deemed to be persuasive.

The claim does not specify what the first program and second program are. There is not even a mention of a "second program" to start with. The claim does not distinguish as to what program does the "monitoring" instead it sets forth language that the "first program" is performing all the claimed functionality without the need for a second program. Therefore, Bradford's volume block resizer as depicted in Figure 3 can be read as the mediator program between the lower level (disk storage) and upper level (file system)

The claim does not set forth as to what constitute unnecessary copy-on-write operations or the process by which the claimed limitations avoid copy-on-write operations as specified in Applicant's disclosure paragraph 0011 (i.e. the use of the use of a file system with the ability to pass

Applicant's specification page 4 and 14 are more specific as to the operation and as such should be considered as necessary language in revising the claim.

Applicant continues to argue that "Bradford, in contrast to Applicant's claims, teaches moving blocks from one volume to another. Bradford is not concerned with minimizing the amount of resources consumed by generating a snapshot of a disk volume" is noted but not deemed to be persuasive.

Applicant's claim does set clearly depict the noted argument. Bradford block moves are not to a different volume but instead just as it is inherent in any space management scenario, it is a movement to consolidate and make efficient the storage space in the original volume (a logical move). More so, Applicant's own disclosure paragraphs 0028-0029 describe block moves using temporary target (logical) before rearrangement to target volume (original volume). While, the second part of the argument appears to be an intended use of the overall invention and not what is explicitly claimed.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. For complete list of cited relevant art, see PTO-form 892

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NEVEEN ABEL JALIL whose telephone number is (571)272-4074. The examiner can normally be reached on 8:30AM-5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christian P. Chace can be reached on 571-272-4190. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Neveen Abel-Jalil
February 2, 2009

/Neveen Abel-Jalil/
Primary Examiner, Art Unit 2165